IS IT RUDE TO POINT?

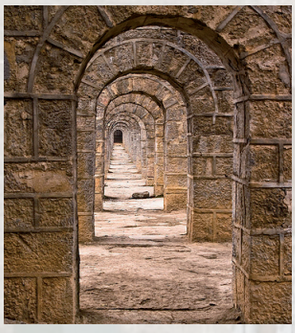
By Charles Hippisley-Cox, University of Huddersfield

One of the most important specifications to 'get right' when dealing with the repair of traditional buildings is that of the mortar for re-pointing

Ideally the finished mortar joint should lie about three millimetres back from the face of the stonework or brickwork. Perhaps the most important criterion for the long-term future of the building is that the pointing mortar be both softer and more porous than the masonry. This is the only way to ensure that the wetting and drying cycles are dealt with by the mortar and not the actual fabric of the building. The relative softness and porosity of the mortar will also reduce potential problems associated with the growth of salt crystals within the pore structure of the stone or brick. A soft and porous mortar will enable salts to be drawn to the surface of the masonry without damaging the stone or brickwork.

Achieving a soft and porous mortar is quite easy when using traditional mixes held together by the carbonation of lime putty. Cement-based mortars should never be used for soft stone or hand-made bricks; however, if the stone is robust and has an open pore-structure, weak cement mortars will perform adequately. Mixtures as strong as 1:6 are suitable for use with such strong building stones as the Millstone Grit and Coal Measures Sandstone of the Pennines for example. But it is important to realise that whenever cement is used (even in conjunction with lime) it will not have the long-term flexibility associated with true lime mortars which can accommodate small-scale structural movement (which is commonplace in most traditional buildings).

One technique known as strap pointing was devised theoretically to throw water away from the face of masonry. It is quite a skilled method of pointing and involves mortar projecting by as much as a couple of centimetres, usually in a strong brittle mortar bound by grey Portland cement. There is a popular perception amongst some tradesmen and building owners that strap pointing looks 'very tidy', but it raises a number of issues. Firstly, it prevents the stonework from 'breathing' through the mortar joints and can lead to spalling of the masonry and, secondly, the aesthetic qualities of the actual stonework are lost with the pointing being visually dominant.



Strap pointing is still widely practised and taught to bricklayers at technical colleges. Whenever used on softer stones, 'strap pointing' seems to fall off within a couple of years! In the West Riding of Yorkshire strap pointing was widely adopted and caused so much damage to historic buildings that the Kirklees Council actually produced a leaflet to encourage alternative pointing methods.

For the hard sandstones of northern England (and similar hard stones such as granite) a cement-based mortar mix could be specified as follows:

- 1 part white cement
- 1 part hydrated lime (to improve the 'workability')
- 4 parts coarse or sharp sand
- 4 parts yellow soft sand.

This will produce a warm-coloured mortar which can be applied up to the face of the masonry then brushed back after about an hour to a couple of millimetres from the face. The brushing will expose the coarse sand or aggregate to produce an attractive (and durable) aesthetic. White cement is preferable to grey OPC as it will allow the natural colours of the aggregate and sand to be displayed. A brushed finish is always a better aesthetic for an historic building than a smooth joint produced by a trowel or a pointing iron. It is best to brush twice – once about 30 minutes after pointing and again in a couple of hours' time to remove the brush marks and 'polish' the exposed aggregate. Pointing mortars are best applied without adding too much water and ideally mixed dry with water added in small quantities until the mix resembles the texture of Muscavado sugar.

Lime-based mortars (either based on putty or bagged hydrated lime) will always tend to produce very white mortars. Pozzolanic additives (powdered volcanic rock or brick dust) enable the lime mortar to set in a similar way to cement mortars (as well as the slow set achieved by carbonation as the putty absorbs CO_2 from the atmosphere to become Calcium Carbonate). Pozzolanic additives may alter the colour of a lime mortar and reduce the whiteness. Avoid cheap bagged lime as it tends to be the same nasty grey as OPC and will make the mortar look dirty.

The colour of a mortar is also something to be considered when specifying for building conservation work. The colour is strongly determined by the choice of sand and/or aggregate. It is advisable to develop a collection of sand ideally from local suppliers to get a good match to the original mortar. The guarantee of a consistent long-term supply is important for long-term or phased projects. It is also important to remember that new work will always look 'fresh' for at least five years and will gradually mellow with age.

There is an interesting dilemma currently facing historic buildings in Normandy. Most of the traditional stone buildings are made from the rather dull granite that weathers to a depressing grey. When 'restored' the bright mortar joints bring the buildings to life and there has been a trend for brighter and brighter mortars and the owners get disappointed when the mortar gradually mellows after a few years!

When a building is freshly pointed it is difficult to see any other materials other than the mortar but it is important to remember that it is essential that the mortar is softer than the masonry and the colour is merely aesthetic and will mellow with age.

The author
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